

STRATEGIC PLAN FOR THE SUBSISTENCE FISHERIES RESOURCE MONITORING PROGRAM, BRISTOL BAY AND CHIGNIK AREAS

EXECUTIVE SUMMARY

A strategic planning process was initiated for the Bristol Bay and Chignik areas of the Southwest region in 2004 to ensure that the Fisheries Resource Monitoring Program (Monitoring Program) focuses on the highest priority information needs for management of Federal subsistence fisheries over the next 3-5 years. The process involved regional managers, scientists, Bristol Bay Regional Subsistence Advisory Council (Council) members, and stakeholder groups, and included participation at workshops held in Anchorage during May 11-13, 2004 and February 9-11, 2005.

There were three distinct phases in the process:

1. Development of a prioritized framework of goals, objectives, and information needs for each identified subsistence fisheries unit (May 2004 workshop);
2. Review of frameworks by agencies, the Council, stakeholders and the general public, and incorporation of relevant comments; and
3. Development of prioritized fisheries unit information needs lists for which Monitoring Program study proposals should be considered, based on results of a study inventory and knowledge gap analysis (February 2005 workshop).

Elements of the framework were considered in the context of enabling legislation, Section 812 of Alaska National Interest Lands Conservation Act¹ (ANILCA), and Federal Subsistence Board (Board) guidelines. Consistent with ANILCA, the workgroup only included information needs that had relevance to management of subsistence fisheries on or associated with Federal public lands. Consistent with Board guidelines, the workgroup acknowledged that hatchery propagation, restoration, enhancement, and supplementation; habitat protection, restoration, and enhancement; and contaminant assessment, evaluation, and monitoring activities were more appropriately funded through other programs, but felt information needs addressing effects of these activities on subsistence resources and fisheries were suitable Monitoring Program study topics. Three other issues were also addressed by the workgroup. First, they felt alternative subsistence fisheries management paradigms should be explored, but decided this should occur on a statewide rather than regional level. Second, they initially identified development of more cost efficient technology, methods and approaches as a specific framework objective with associated information needs, but then decided to treat this matter as an underlying principle for conducting any study rather than a specific study topic. Third, they agreed it was necessary to continue cataloging relevant regional studies each year to update the gap analysis.

The Analytic Hierarchy Process was used to structure and prioritize plan frameworks using the expert judgment of workshop participants. This allowed participants to focus on smaller sets of choices, which improved their ability to think through problems in a systematic and thorough manner, explicitly state judgments concerning preference or importance, and make accurate judgments. Three Subsistence Fisheries Units (Fisheries Units) were identified and prioritized,

as well as 17 species or species groups by river/lake system within these Fisheries Units (Table 1). The salmon fisheries units were judged to be of greater ecological importance and of more value to subsistence users than the non-salmon fisheries unit; and Bristol Bay salmon were considered to be of slightly greater importance to Federal management than Chignik salmon.

Table 1. Perceived importance of subsistence fishery resources, grouped by fisheries unit, within Bristol Bay and Chignik areas. Fisheries units are arranged left to right, from most to least important. Resources are arranged alphabetically within groups of importance.

Bristol Bay Salmon	Chignik Salmon	Bristol Bay-Chignik Non-salmon Species
<i>Highly Important</i>		
Lake Clark sockeye	Clark River late-run sockeye	Bristol Bay rainbow trout
Togiak Chinook	Perryville coho	Lake Clark whitefish species
Togiak coho		Togiak Dolly Varden
Togiak sockeye		Togiak smelt species
<i>Moderately Important</i>		
Alagnak River sockeye	Clark River coho	Bristol Bay Arctic grayling
Eastside coho		Bristol Bay northern pike
Egegik sockeye		Chignik rainbow smelt
Igushik River sockeye		
Kulukak River Chinook, sockeye, coho		

Planning frameworks were developed and prioritized for all three fisheries units (Figures 1 and 2). A top-down structuring approach was used within each Fisheries Unit, where the mission was the first (top) level of the hierarchy, goals the second, objectives the third, and information needs the fourth (bottom) level. The workgroup was not tasked with modifying the Monitoring Program's mission statement, which was developed by the Office of Subsistence Management. However, the four goals of the Monitoring Program, also initially developed by the Office of Subsistence Management, were reviewed and in some cases, modified by the workgroup to improve clarity and avoid the occurrence of common objectives and information needs. Only the first three goals, which involve information collection and synthesis, were included as part of Fisheries Unit planning frameworks. The fourth goal, public support and involvement for fisheries monitoring, will be addressed through a separate planning process.

Although the same framework and priorities were used for both the Bristol Bay salmon and Chignik salmon subsistence fisheries units, they were treated separately to provide for differences between these two areas, and because Bristol Bay salmon was thought to be of slightly greater importance to Federal management. The Bristol Bay-Chignik Non-salmon Species framework had fewer objectives than the salmon framework. Participants thought this fisheries unit required less intensive management than either of the salmon fisheries units since none of these species were commercially harvested and only a few species were the target of sport as well as subsistence fisheries. Therefore, participants also felt annual collection of most information was necessary for non-salmon species.

MISSION: To identify and provide information needed to sustain subsistence fisheries on Federal public lands for rural Alaskans through a multidisciplinary, collaborative program.

<u>GOAL</u>	<u>OBJECTIVE</u>	<u>INFORMATION NEED</u>	
0.503 Sustain healthy salmon populations that support subsistence uses	0.344 Determine spawning escapement needed to sustain subsistence fisheries	0.165 Obtain reliable estimates of spawning escapement over time	
		0.063 Describe relationship between escapement and production including smolt production	
		0.058 Identify critical factors that affect population dynamics including effects of restoration and enhancement on wild stocks	
		0.037 Determine quantity of salmon by river/lake system needed to sustain ecosystem functions	
		0.021 Relate historic salmon harvest to current productivity levels of river/lake systems	
	0.159 Characterize and define abundance, composition, and timing of salmon populations	0.077 Estimate abundance of total run by species and river/lake system	
		0.055 Determine adult timing and migration patterns by stock, size, and age	
		0.027 Define and catalog management units that sustain subsistence fisheries	
	0.299 Document subsistence uses	0.120 Document the current fishery	0.081 Annually estimate subsistence harvest effort by location, type, species, and date
			0.039 Independently verify permit data
0.115 Identify and describe trends in past and present use patterns		0.036 Estimate historic harvest levels and effort, and evaluate trends and data quality	
		0.031 Identify and evaluate factors affecting subsistence uses	
		0.018 Document changes in harvest timing and factors influencing it	
		0.016 Describe current and historic fish processing and distribution practices including sharing, barter, and trade	
		0.014 Describe historic and current harvest methods and means by species and area	
0.064 Project future use patterns		0.024 Gather local perspectives on future use patterns	
		0.030 Evaluate key factors influencing future use patterns	
		0.010 Build process based models to predict future use patterns	
0.198 Effective management to provide for subsistence uses	0.113 Develop and evaluate management strategies to provide for subsistence fisheries	0.047 Evaluate usefulness and effectiveness of current regulations	
		0.039 Develop information sharing between stakeholders and agencies	
		0.027 Examine alternative management strategies	
	0.085 Assess impacts of other fisheries on subsistence fisheries	0.051 Describe socioeconomic and cultural impacts of other fisheries	
		0.034 Describe total harvest rates by fishery for specific stocks of interest	

Figure 1. Framework of goals, objectives and information needs, including adjusted weights of importance, Bristol Bay and Chignik salmon subsistence fisheries units, 2005.

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<u>GOAL</u>	<u>OBJECTIVE</u>	<u>INFORMATION NEED</u>
0.267 Sustain healthy fish populations that support subsistence uses	0.267 Characterize life history, population structure and dynamics, and estimate abundance	0.078 Estimate abundance and composition by species and river/lake system
		0.071 Identify critical factors that influence population dynamics
		0.060 Describe trends in populations
		0.036 Determine timing and migration patterns
		0.022 Define and catalog management units that sustain subsistence fisheries
0.448 Document subsistence uses	0.330 Identify past and present use patterns	0.079 Periodically (about five year intervals) estimate harvest and effort by location, gear type, species, and season
		0.077 Estimate historic harvest levels and identify trends
		0.069 Identify factors affecting subsistence uses
		0.057 Describe historic and current harvest methods and means by species, area, and time
		0.048 Describe current and historic fish processing and distribution practices including sharing, barter, and trade
	0.118 Project future use patterns	0.050 Gather local perspectives on future use patterns
		0.046 Evaluate key factors influencing future use patterns
0.285 Effective management to provide for subsistence uses	0.122 Develop and evaluate management strategies to provide for subsistence fisheries	0.022 Build process based models to predict future use patterns
		0.038 Develop information sharing between stakeholders and agencies
		0.032 Determine whether current regulations are providing for adequate subsistence opportunities and harvests
		0.028 Examine alternative management strategies
	0.163 Assess impacts of other fisheries on subsistence fisheries	0.024 Determine compliance and support for current regulations
		0.086 Describe socioeconomic and cultural impacts of other fisheries
		0.077 Describe total harvest rates by fishery for specific stocks of interest

Figure 2. Framework of goals, objectives and information needs, including adjusted weights of importance, Bristol Bay-Chignik non-salmon species fisheries unit.

A comprehensive inventory of all relevant studies, past and present, was developed for each information need within each fisheries unit. For the Bristol Bay and Chignik salmon fisheries units, the workgroup identified a total of 138 unique studies that have relevance to information needs identified in the strategic plan. For the Bristol Bay-Chignik non-salmon species subsistence fisheries unit, the workgroup identified a total of 94 unique studies. Using the study inventory, the workgroup summarized the current state of knowledge for each information need, which has been characterized as “adequate”, “incomplete”, or “lacking”.

Of the 23 information needs identified for the Bristol Bay and Chignik salmon subsistence fisheries units, the workgroup judged the state of knowledge to be “adequate” for only five, and for two of those five information needs, knowledge was judged to be “adequate” only for Bristol Bay sockeye salmon. For most information needs, the state of knowledge was judged to be “incomplete”. However, for seven information needs, the state of knowledge was judged to be “lacking” for one or more species. Following assessment of knowledge gaps for each information need, proposals would be considered for 16 Bristol Bay and 18 Chignik information needs for 2007 (Table 2). Gap analysis results were then used in conjunction with importance ranking of information needs to identify the highest strategic priorities for the Bristol Bay and

Table 2. Summary of state of knowledge (gap analysis) and decisions on whether to consider Monitoring Program study proposals for Bristol Bay (BB) and Chignik (C) salmon fisheries unit information needs. Chinook salmon were not considered an important subsistence species for the Chignik area, so proposal consideration is not applicable (N/A) there for this species. Decisions on whether to consider proposals will be used for 2007 Request for Proposals, but may be changed in succeeding years based on gap analysis reassessment.

Information Need	State of Knowledge			Consider Proposals in	
	Adequate	Incomplete	Lacking	2007 Bristol Bay	Chignik
1A1. Obtain reliable estimates of spawning escapement					
sockeye salmon	BB	C		No	Yes
coho salmon		BB&C		Yes	Yes
Chinook salmon		BB		Yes	N/A
1A2. Describe relationship between escapement and production					
sockeye salmon		BB&C		Yes	No
coho salmon		C	BB	Yes	Yes
Chinook salmon			BB	Yes	N/A
1A3. Identify critical factors that affect population dynamics					
sockeye salmon		BB&C		Yes	No
coho salmon		BB&C		Yes	Yes
Chinook salmon		BB		Yes	N/A
1A4. Determine the quantity of salmon by river/lake system that should be allowed to escape to sustain ecosystem functions		BB&C		Yes	Yes

-continued-

Table 2. Continued

Information Need	State of Knowledge			Consider Proposals in	
	Adequate	Incomplete	Lacking	2007 Bristol Bay	Chignik
1A5. Relate historic salmon harvest to current productivity of river/lake systems					
sockeye salmon		BB	C	No	Yes
coho salmon			BB&C	Yes	Yes
Chinook salmon			BB	Yes	N/A
1B1. Estimate abundance of total run by species and river/lake system					
sockeye salmon		BB&C		Yes	No
coho salmon		BB&C		No	No
Chinook salmon		BB		No	N/A
1B2. Determine adult timing and migration patterns by stock, sex, size, and age					
sockeye salmon	BB	C		No	No
coho salmon		BB&C		Yes	No
Chinook salmon		BB		Yes	N/A
1B3. Define and catalog management units that sustain subsistence fisheries	BB & C			No	No
2A1. Annually estimate subsistence harvest effort by location, gear type, and date	BB & C			No	No
2A2. Independently verify permit data		BB&C		Yes	Yes
2B1. Estimate historic harvest levels and effort, and evaluate trends and data quality		BB&C		Yes	Yes
2B2. Identify and evaluate factors affecting subsistence uses		BB&C		Yes	Yes
2B3. Document changes in harvest timing and factors influencing it		BB&C		Yes	Yes
2B4. Describe current and historic fish processing and distribution practices including sharing, barter, and trade		BB&C		No	Yes
2B5. Describe historic and current harvest methods and means by species and area	BB	C		No	Yes
2C1. Gather local perspectives on future use patterns			BB&C	Yes	Yes
2C2. Evaluate key factors influencing future use patterns			BB&C	Yes	Yes
2C3. Build process based models to predict future use patterns			BB&C	No	No
3A1. Evaluate usefulness and effectiveness of current regulations		BB&C		No	Yes
3A2. Develop information sharing between stakeholders and agencies		BB&C		Yes	Yes
3A3. Examine alternative management strategies		BB&C		Yes	Yes
3B1. Describe socioeconomic and cultural impacts of other fisheries		BB	C	No	Yes
3B2. Describe total harvest rates by fishery for specific stocks of interest		BB	C	Yes	Yes

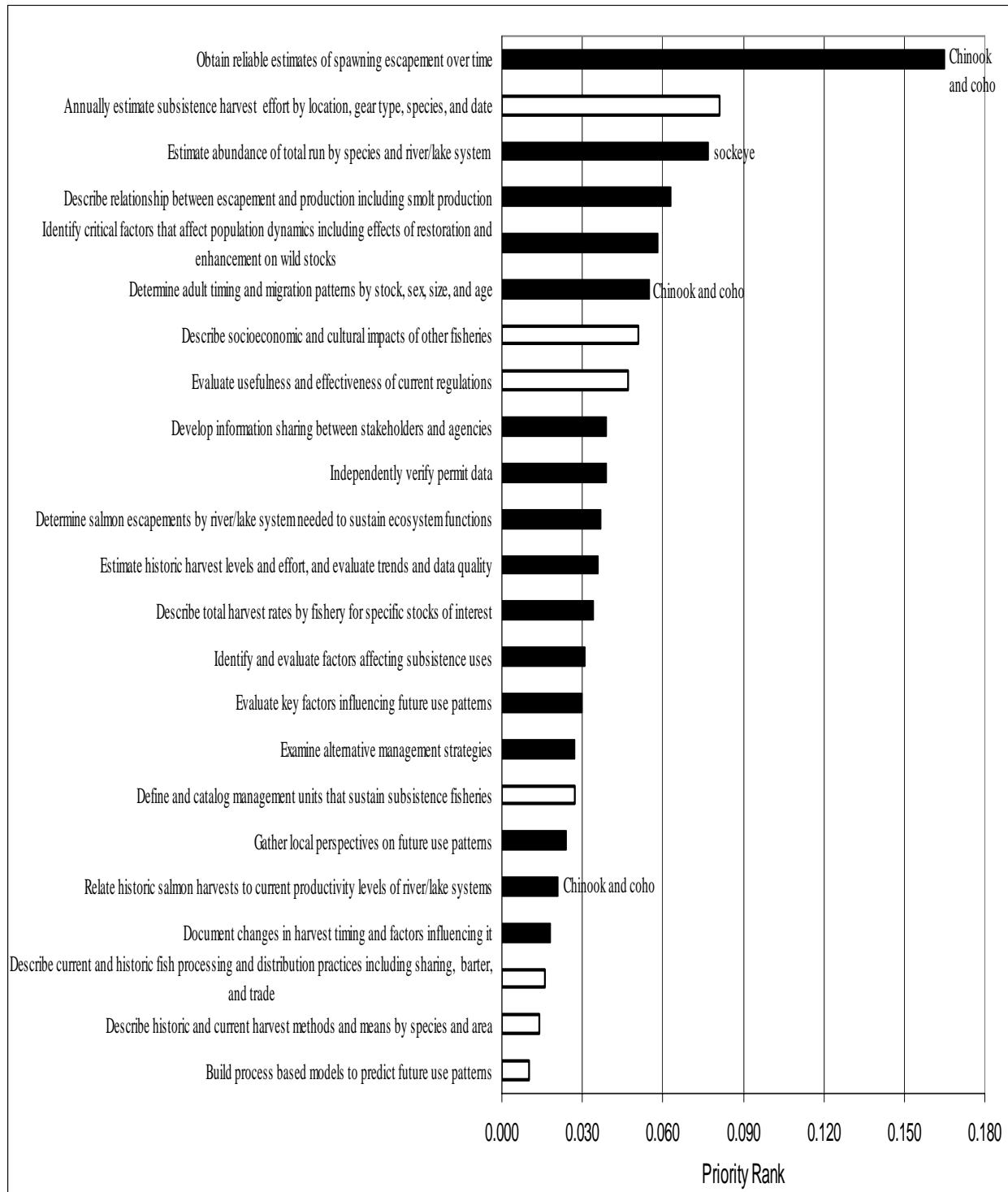


Figure 3. Gap analysis results showing information needs for which proposals should either be considered (black bars) or not considered (open bars) for the structurally adjusted Bristol Bay salmon fisheries unit planning framework. Decisions on whether to consider proposals will be used for 2007 Request for Proposals, but may be changed in succeeding years based on gap analysis reassessment. Proposals for sockeye, Chinook, and coho salmon will be considered, unless fewer species are shown next to a bar. See Table 1 for the most important stocks to study.

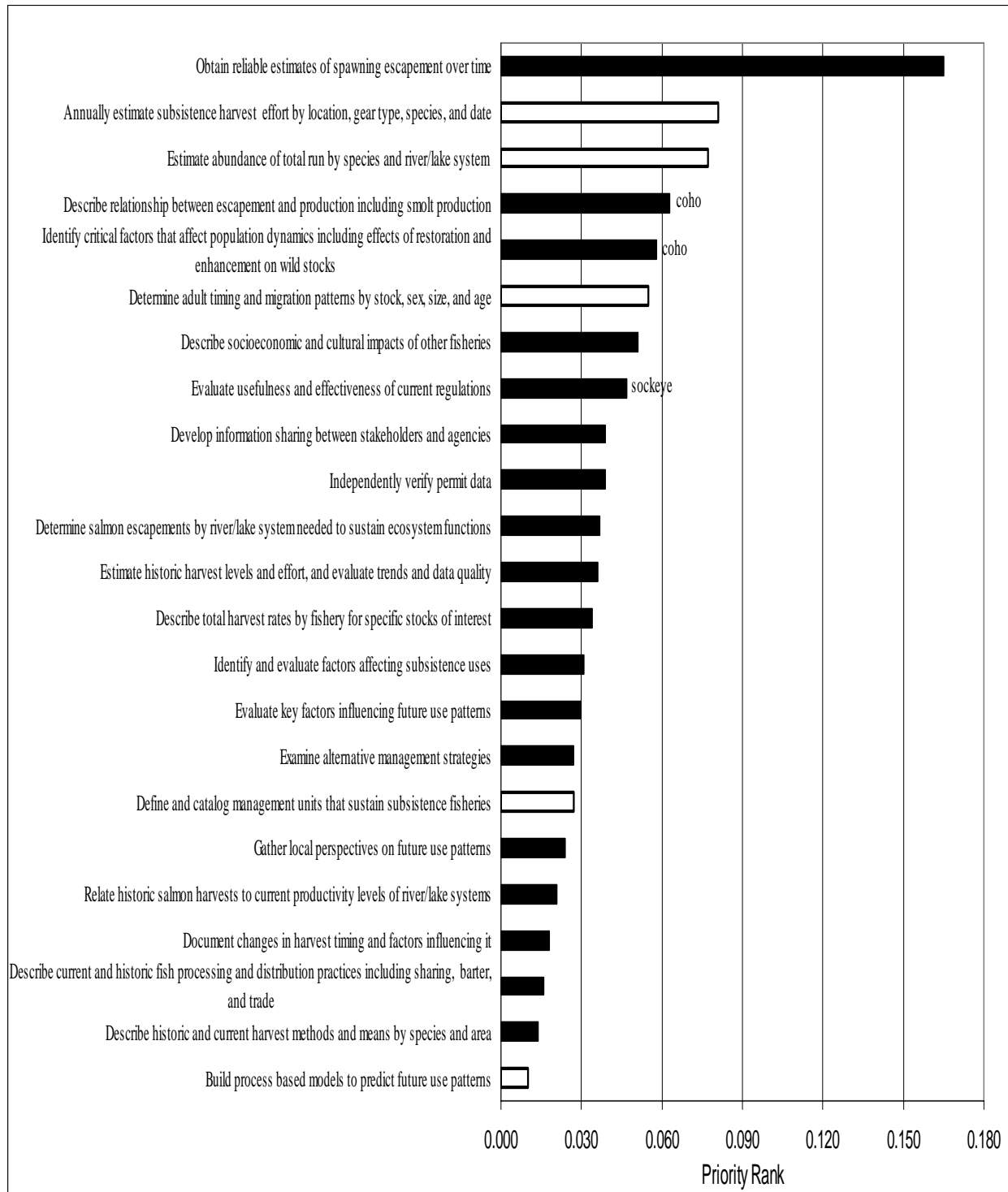


Figure 4. Gap analysis results showing information needs for which proposals should either be considered (black bars) or not considered (open bars) for the structurally adjusted Chignik salmon fisheries unit planning framework. Decisions on whether to consider proposals will be used for 2007 Request for Proposals, but may be changed in succeeding years based on gap analysis reassessment. Proposals for sockeye, Chinook, and coho salmon will be considered, unless fewer species are shown next to a bar. See Table 1 for the most important stocks to study.

Chignik salmon fisheries units (Figures 3 and 4). Results for both salmon fisheries units were very similar, and proposal solicitation for 2007 could be focused on the top half of the 16 to 18 information needs within each fisheries unit for which proposals could be considered. These eight or nine information needs would account for about 53% of the structurally adjusted total weight of information needs within each of the salmon fisheries units.

Of the 19 information needs identified for the Bristol Bay-Chignik non-salmon species subsistence fisheries unit, the workgroup judged the state of knowledge to be “adequate” for only four, and for two of those four information needs, knowledge was judged to be “adequate” only for Bristol Bay rainbow trout. For most information needs, the state of knowledge was judged to be “incomplete”. However, for eight information needs, the state of knowledge judged to be “lacking” for one or more species. Following assessment of knowledge gaps for each information need, the workgroup recommended that proposals be considered for 11 information needs for 2007 (Table 3). Gap analysis results were used in conjunction with importance ranking of information needs to identify the highest strategic priorities for the Bristol Bay-Chignik non-salmon fisheries unit (Figure 5). Proposal solicitation for 2007 could be focused on the top half of the 11 information needs for which proposals could be considered. These six information needs would account for about 45% of the structurally adjusted total weight of information needs within this fisheries unit. However, differences among importance rankings for Bristol Bay-Chignik non-salmon fisheries unit information needs (range: 2.2% to 8.6% of total weight) were not as great as those for the salmon fisheries units (range: 1.0% to 16.5% of total weight).

This strategic plan should provide an explicit and rigorously developed forum for researchers, the Technical Review Committee, the Council, and the Federal Subsistence Board to focus Monitoring Program funding towards the highest informational priorities in the Bristol Bay and Chignik areas. The strategic plan encompasses all important issues and information needs, as well as fishery resources, previously identified by the Council and from village surveys conducted by Bristol Bay Native Association, which meet the requirement of Federal nexus. Additionally, by developing a prioritized framework and conducting an information gap analysis, the strategic planning plan will help ensure that the Monitoring Program remains focused on the highest priorities for management of Federal subsistence fisheries within this area during the 3-5 year plan horizon. Since the gap analysis will be reviewed and revised annually, strategic priorities for information can be easily updated for each year’s Annual Monitoring Plan.

Table 3. Summary of state of knowledge (gap analysis) and decisions on whether to consider Monitoring Program study proposals for Bristol Bay-Chignik non-salmon fisheries unit information needs. Decisions on whether to consider proposals will be used for 2007 Request for Proposals, but may be changed in succeeding years based on gap analysis reassessment.

Information Need	State of Knowledge			Consider Proposals
	Adequate	Incomplete	Lacking	
1A1. Estimate abundance and composition by species and river/lake system				
Arctic grayling		X		Yes
northern pike and smelt			X	Yes
rainbow trout				No
Dolly Varden		X		No
whitefish			X	No
1A2. Define and catalog management units that sustain subsistence fisheries				
Dolly Varden		X		Yes
rainbow trout	X			No
Arctic grayling		X		No
whitefish, northern pike, and smelt			X	No
1A3. Identify critical factors that affect population dynamics			X	Yes
1A4. Determine timing and migration patterns				
rainbow trout		X		Yes
Arctic grayling, northern pike, and smelt			X	Yes
Dolly Varden		X		No
whitefish			X	No
1A5. Describe trends in populations				
Arctic grayling		X		Yes
northern pike and smelt			X	Yes
rainbow trout and Dolly Varden		X		No
whitefish			X	No
2A1. Periodically (about five year intervals) estimate harvest and effort by location, gear type, species, and season		X		Yes
2A2. Estimate historic harvest levels and identify trends		X		Yes
2A3. Identify factors affecting subsistence uses		X		No
2A4. Describe historic and current harvest methods and means by species, area, and time		X		No
2A5. Describe current and historic fish processing and distribution practices including sharing, barter, and trade		X		No
2B1. Gather local perspectives on future use patterns			X	Yes
2B2. Evaluate key factors influencing future use patterns			X	Yes
2B3. Build process based models to predict future use patterns			X	No
3A1. Determine whether current regulations provide for subsistence opportunities and harvests		X		No
3A2. Develop information sharing between stakeholders and agencies		X		Yes
3A3. Evaluate alternative management strategies	X			No
3A4. Determine compliance and support for current regulations	X			No
3B1. Describe socioeconomic and cultural impacts of other fisheries		X		Yes
3B2. Describe total harvest rates by fishery for specific stocks of interest		X		No

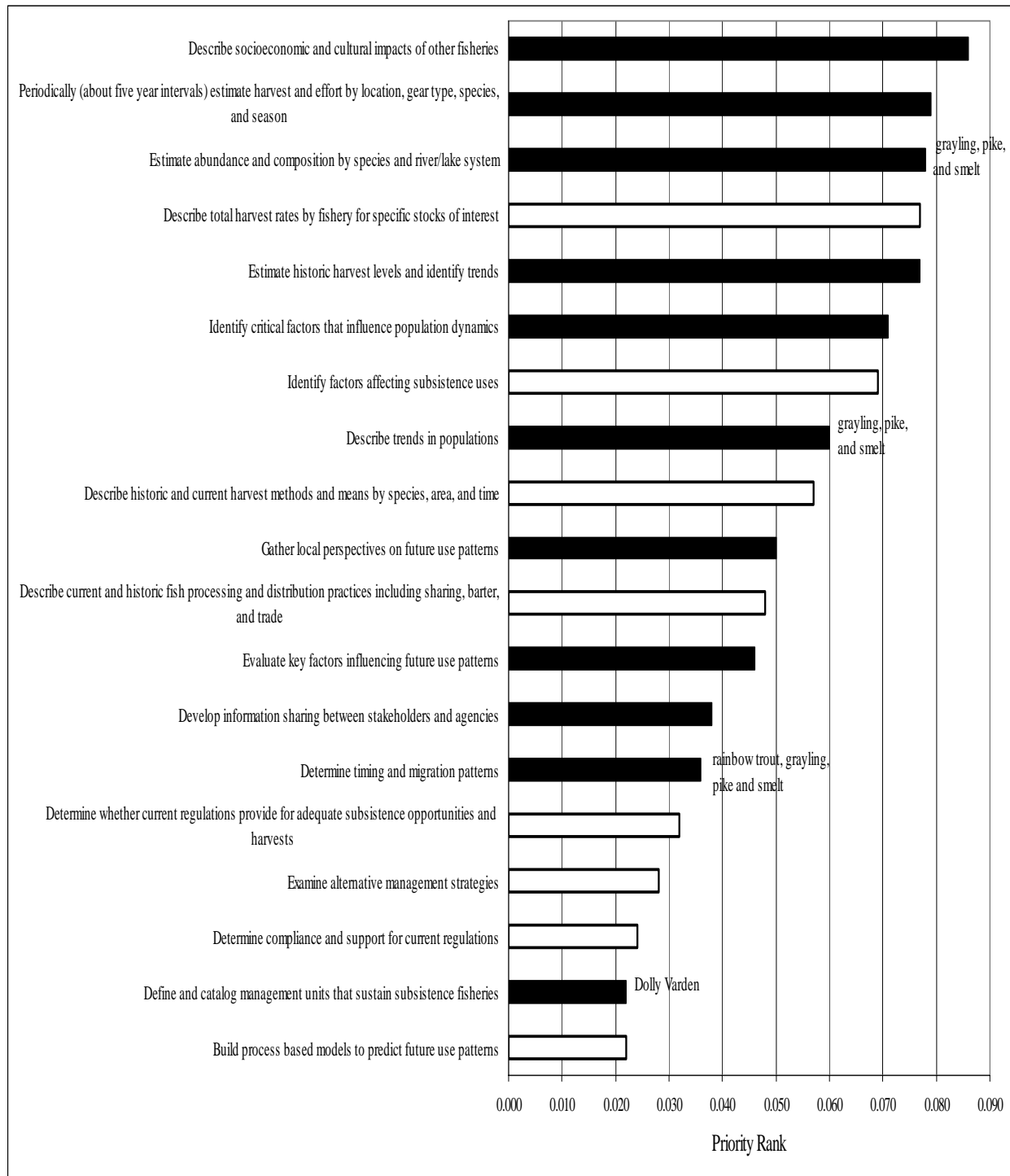


Figure 5. Gap analysis results showing information needs for which proposals should either be considered (black bars) or not considered (open bars) for the structurally adjusted Bristol Bay-Chignik non-salmon fisheries unit planning framework. Decisions on whether to consider proposals will be used for 2007 Request for Proposals, but may be changed in succeeding years based on gap analysis reassessment. Proposals for rainbow trout, whitefish species, Dolly Varden, smelt species, Arctic grayling, and northern pike will be considered, unless fewer species are shown next to a bar. See Table 1 for the most important stocks to study.